

Appl. No. 10/036,274
Amdt. Dated Dec.12, 2003
Reply to Office Action of Sep. 12, 2003

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

CLAIMSWe claim:

Claim 1 (currently amended): An optical attenuator for attenuating optical signals in an optical path, comprising:

an optical splitter for splitting an input optical signals from an input fiber into ~~two portions~~ a first portion and a second portion, the optical splitter comprising a ferrule and a graded index (GRIN) lens, one portion of the input optical signals being transmitted to an attenuating element and a the ferrule retaining an end of the input fiber and an end of a second fiber, said second fiber receiving the second portion of the input optical signals, and the second portion of the input optical signals being transmitted to a first detector;

an output port for splitting attenuated optical signals into two portions, one portion of the attenuated optical signals being transmitted to an output fiber and a second portion of the attenuated optical signals being transmitted to a second detector; and

an attenuating element for attenuating the input optical signals, the attenuating element receiving the first portion of the input optical signals, the attenuating element being driven by a drive device in response to signals from the first detector and the second detector; wherein

the first detector is positioned to receive said second portion of the input optical signals and the second detector is positioned to receive said second portion

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of the attenuated optical signals, and the GRIN lens has a first surface coated with an antireflection film and a second surface coated with a beam splitter film.

Claims 2-3 (cancelled)

Claim 4 (original): The optical attenuator as claimed in claim 1, wherein the output port is a collimator.

Claim 5 (cancelled)

Claim 6 (original): The optical attenuator as claimed in claim 1, wherein the first detector and the second detector respectively include a photodiode.

Claims 7-11 (cancelled)

Claim 12 (currently amended): An optical attenuator comprising:

an input collimator including ~~an input collimator with a~~ first graded index (GRIN) GRIN-lens and a first ferrule, main and sample input fibers retained in the first ferrule, a beam splitter film applied on ~~the~~ said first GRIN lens;

an output collimator including ~~an output collimator with a~~ second GRIN lens and a second ferrule, ~~main~~ main and sample output fibers retained in the second ferrule, a beam splitter film applied on said second GRIN lens;

an input detector connected to a distal end of said sample input fiber;

an output detector connected to a distal end of said sample output fiber; and

an attenuation element interrupting a light path defined between said ~~input~~ first GRIN lens and said ~~output~~ second GRIN lens; wherein

said attenuation element is controllable to move according to detection results from both said first and second detectors.